



Mini-Review article

Dengue outbreak during COVID-19 pandemic in Southeast Asian countries: overburdened the health care system

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ABSTRACT

The world is now undergoing in coronavirus disease 2019 (COVID-19) pandemic. During this crisis, the increasing incidence of dengue become a further threat in multiple dengue-endemic countries of Southeast Asia. In this study, the cases of COVID-19 and dengue outbreaks, their co-infection and co-epidemics are reviewed. Countries like Indonesia, Philippines, Malaysia, Singapore, Vietnam, Thailand, and Sri Lanka have been infected highly from both of COVID-19 and dengue, simultaneously. Thus, double outbreaks of COVID-19 and dengue overwhelm the healthcare systems that have really been posed challenges to combat it. Further complications have been occurred due to co-infection and co-epidemics of COVID-19 and dengue. Physicians are in trouble to ensure accurate diagnosis and treatment for overlapping signs and symptoms. The healthcare system is being fragile and needs to revive by taking immediate measures. An accurate identification and proper clinical treatment are vital for COVID-19 management. Besides, an effective mosquito control program is recommended to combat dengue that also help to stop co-epidemics of COVID-19 and dengue as well.

Introduction

The COVID-19 is an ongoing global pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The world has been chained with COVID-19 pandemic till today. Since December 2019, the outbreak of COVID-19 was first identified in Wuhan, China, and spread in 213 countries across the world in just about a few months [1]. The World Health Organization (WHO) declared the COVID-19 outbreak a Public Health Emergency of International Concern on 30 January 2020, and a pandemic on 11 March 2020 [2]. As of 30 July 2020, the total confirmed cases of COVID-19 have reached more than 17 million with over 0.67 million deaths globally [3]. While COVID-19

causes havoc across the world, multiple countries in Southeast Asia have been facing with another epidemic- Dengue, a known tropical disease [4]. Dengue is the most rapidly spreading mosquito-borne viral infection, considered as a 'major public health concern'. Worldwide, an estimated 2.5 billion people (around 40% - 50% of the world's population) are at risk of dengue infection, approximately 975 million of whom live in urban areas in tropical and sub-tropical countries of Southeast Asia, the Pacific and the Americas [5]. The global incidence of dengue has grown dramatically in recent decades. Up to 100-400 million infections are estimated to occur annually in over 125 endemic countries in the world with

20,000-25,000 death. The incidence of dengue has increased 30-fold over the last 50 years [6].

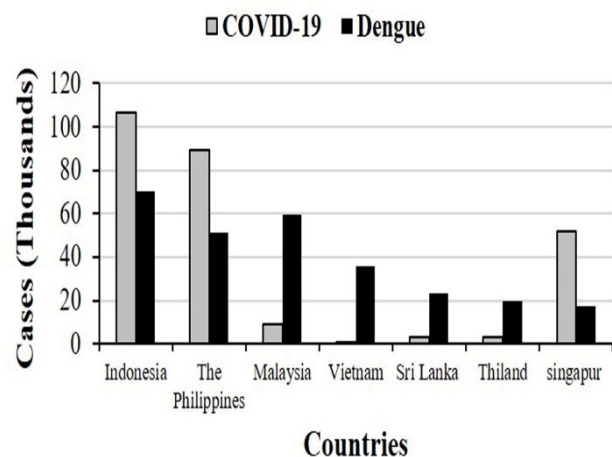
During the COVID-19 pandemic, the increasing incidence of dengue become a threat especially in the dengue-endemic countries of Southeast Asia which have been posed new challenges to combat the diseases simultaneously. As the combination of COVID-19 and dengue is assumed as dangerous for health care systems in these countries [7]. Here, in this study, the present status of COVID-19 and dengue cases in Southeast Asian countries along with their co-infection and co-epidemics are critically reviewed for taking proper measures to revive the overburdened healthcare system.

Dengue is threatening as a second outbreak after COVID-19 pandemic

Dengue, a mosquito-borne viral infection, is itself a great threat for the tropical and subtropical countries in the world. Dengue cases have been increased as a second outbreak during COVID-19 crisis in several Southeast Asian countries and poses a substantial disease burden. Dengue occurs every year in the world with the highest burden in Southeast Asia followed by Latin America [8]. Severe dengue is a leading cause of serious illness and death in some Asian countries that are dengue-endemic [6].

The countries in Southeast Asia like Indonesia, the Philippines, Malaysia, Vietnam, Singapore, Thailand, and Sri Lanka are currently at a high risk of dengue outbreak as dengue infection is increasing at an alarming rate (**figure 1**) [9,10]. In fact, most of these countries have a history of repeated outbreaks of dengue. Interestingly, all these countries are currently suffering seriously from corona infection also. In these countries, therefore, both COVID-19 and dengue are occurring simultaneously. For instance, Indonesia, the Philippines, and Malaysia are currently suffering highly from concurrent outbreaks of dengue and COVID-19 with notable deaths. It is worthy to mention that the first case of COVID-19 was reported in Southeast Asia (Thailand) on 13 January 2020 [11]. The COVID-19 pandemic reached the tropical shores of South Asia, Africa, and South America slightly later than Europe and East Asia [4].

Figure 1. Co-epidemics in South Asia



Dengue and COVID-19 co-epidemics overburdened the healthcare system

Simultaneous outbreak of COVID-19 and dengue have already added heavy burdens on healthcare systems in several Southeast Asian countries [12]. Consequently, the double epidemic battle could lead to the collapse of healthcare systems in these countries. Thus, the already fragile healthcare systems become overwhelmed [13].

Furthermore, co-infection of SARS-CoV-2 and dengue virus to the patient is another health burden issues that have been occurred in several dengue-endemic countries like Singapore, Thailand, India, and Bangladesh [14]. Therefore, there is a possibility for more cases of co-infection to occur in the other countries of Southeast Asia where both viruses are co-existing and co-circulating. It is known from the earlier report that the co-infected people died in Thailand, India, and Bangladesh [14]. Thus, coinfection poses a challenge for accurate diagnosis and treatment, particularly when patients present with undifferentiated fever with nonspecific signs and symptoms. Moreover, the initial symptoms of co-infected patients such as fever, aches, and rash are seen to be similar. The distinction can be made as the disease progresses. Thus, it is difficult to distinguish between dengue and COVID-19 because they share similar clinical and laboratory features [15]. Further complications have been raised when SARS-CoV-2 infection gave false-positive results for dengue in the rapid serological tests [15] where the patients were first wrongly diagnosed with dengue then later confirmed to be COVID-19. Thus, the new symptom of COVID-19 was discovered where the patient was suspected of suffering from dengue fever [16]. Misdiagnosis of

COVID-19 as dengue with failure to isolate such patients results in a delay in diagnosis of SARS-CoV-2 infection that ultimately leads to further spread of the virus [15].

Conclusion and recommendation

The world is now struggling against the burden of COVID-19 pandemic while several Southeast Asian countries are facing dengue as a second outbreak. Finally, co-infection and co-epidemics of COVID-19 and dengue posed extra challenges. Co-infected patients with overlapping signs and symptoms make the diagnosis and treatment difficult for the physicians. Therefore, health care professionals should be aware of possible co-infection and co-epidemics of SARS-CoV-2 and dengue. Highly accurate and accessible diagnostic tests for COVID-19 and dengue are strongly recommended for early and proper recognition of infecting pathogen as well as for avoiding false positive results. Besides, an effective mosquito control program is recommended to combat dengue successfully especially in the Southeast Asian countries where co-epidemic occurs.

Conflict of interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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